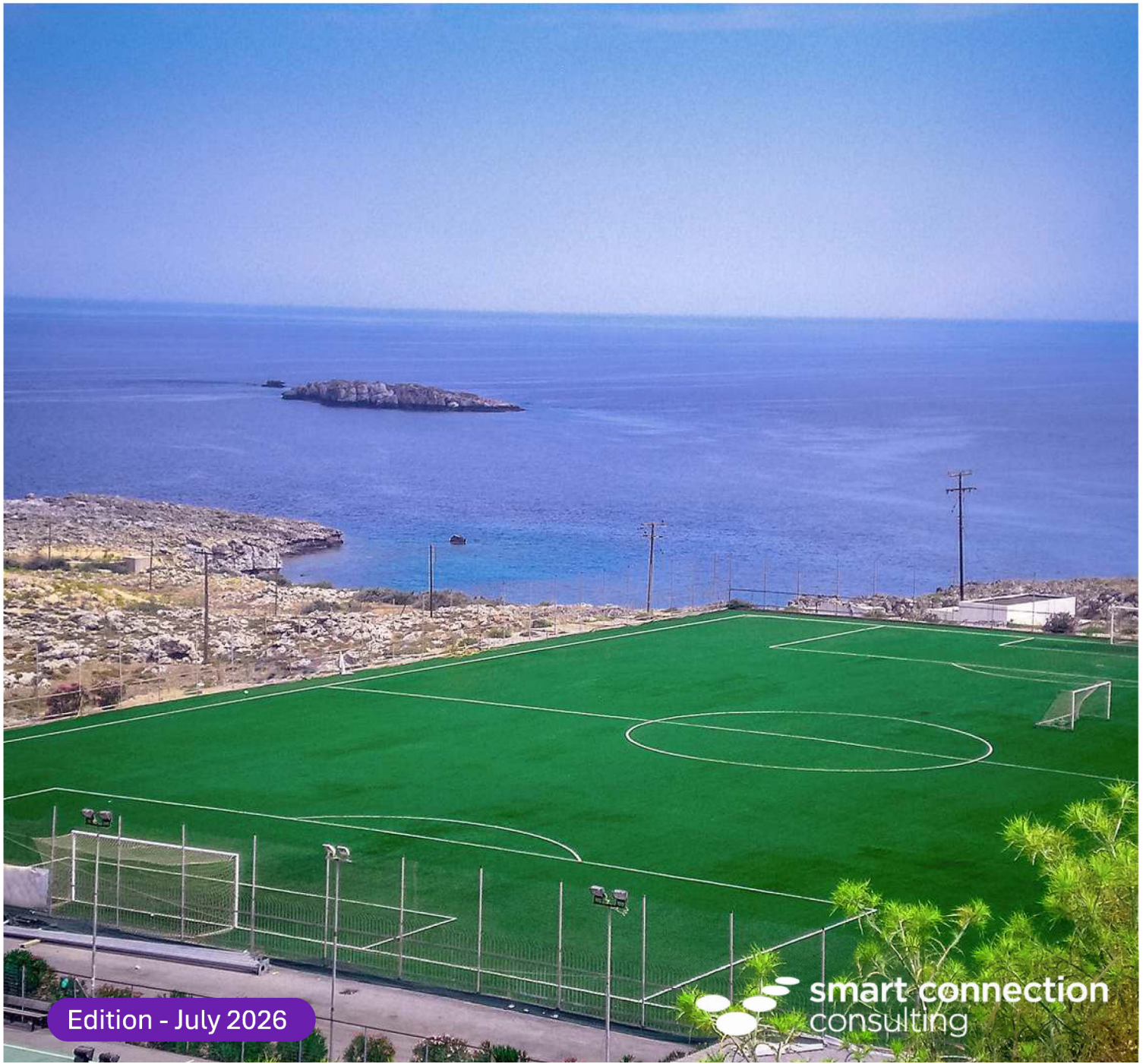


ENVIRONMENTAL IMPACT OPPORTUNITIES

Creating positive environmental impact with synthetic sports surfaces



Environmental Impact Opportunities

Purpose and Context

Synthetic sports surfaces are usually considered where natural turf cannot reliably meet demand, wet-weather impacts, or sport-specific performance needs. Environmental impacts still need to be assessed honestly, including heat, runoff, microplastics, soil health, biodiversity, carbon and end-of-life waste.

However, contemporary synthetic, hybrid, acrylic and rubber systems can also create environmental opportunities when selected for the right site and managed as part of the whole parkland. The strongest outcomes come when a project is planned beyond the field of play, integrating drainage, trees, materials, water reuse, maintenance and renewal together. Our commitment in the planning and design stage should be about reducing environmental impact and where possible, creating greater environmental outcomes.

Strategic advancements in manufacturing, technology, regulation, and environmental policy have reshaped synthetic sports surface systems to align with global sustainability goals, including the United Nations Sustainable Development Goals (UN SDGs), Australia's climate resilience strategies, and local government triple-bottom-line frameworks. Today's synthetic systems are designed to be smarter, cooler, safer, and far more ecologically sound than their predecessors.

There are many different kinds of synthetic surfaces from best practice to a cheaper mass produced market. It is therefore critically important in the planning, design and procurement stages of a new or upgraded sports fields or surface that the quality requirements are considered and specified. Not all synthetic surface options will be environmentally positive.

Why the Environment Matters

The environment that we live in is critical to the quality and life expectancy of the planet, and we therefore have a custodial role on behalf of future generations.

The owners of the land need to balance demand for additional sports facilities with the passive demands, environmental impact, and health of the community. All need to be considered at the same time.

If we are committed to encouraging people to play sport for the physical and mental health benefits of the community, the impact on the environment needs to be considered. This could mean that we need to embrace technology to increase the ability of natural turf to cope with demand.

If the demand exceeds the playing capacity of the surface, then synthetic technology should be considered strategically, as opposed to converting more passive parkland or bush areas into sports facilities.



Photo: Synthetic Football Field in Norway, One of the Globes Most Sensitive Environmental Eco-systems

If the decision is made to embrace synthetic sports surfaces, including rubber, acrylic, or grass surfaces, then the planning, design, and delivery must be assessed by environmental principles focused wherever possible on enhancing, and not reducing, environmental outcomes.

Manage the Risks

Environmental opportunity only exists when key risks are designed and managed. Projects should avoid unsuitable flood, bushfire, sensitive habitat and waterway locations unless risks can be adequately mitigated. Runoff and walk-off controls should capture fibres, infill and debris. Soil and biodiversity impacts should be addressed through tree protection, planting and habitat connections. Materials should be assessed for durability, contaminants, heat and recyclability. Maintenance must include filters, edges, drainage and records. If these controls cannot be delivered or funded, the project should be reconsidered.

Challenges – Perceived and Actual

There are community groups or alliances that have expressed concerns about the use of non-natural surfaces for sport and may not appreciate the full technical research around some of their concerns. The Smart Guide 4; Environmental Opportunities addresses each of their concerns and demonstrates that each aspect raised has mitigation strategies that can either significantly reduce or eliminate the concerns, including:

- **Heavy metal leaching** – in quality fields to FIFA has no heavy metals in the colouring and only using organic infills eliminates rubber leaching
- **Urban Heat Island impact** – The NSW Chief Scientist identified this as very low and localised risk, that said, it can be reduced further by use of organic infill and open aggregate road base for the pavement
- **Heat Stress for players** – Organic infill, aligned tree canopy, shade structure and embracement of Sports Heat Policies address this concern
- **Microplastic migration into landscape and waterways** – removal of all rubber infill and containment strategy with sub-surface drainage

reduces opportunity by 98% and maintenance program and UVR strengthened turf will reduce the amount of yarn breakage

- Flood damage – a proper drainage strategy for the whole parkland and not just the field of play with an appropriate AEP standard is critical
- PFAS – all the major quality suppliers are now working to the new global standard on PFAS Testing for Synthetic surfaces, so that there are not intentionally added PFAS chemicals, there may still be environmental PFAS, from football boots, machines etc. There is significant chance of less PFAS than in natural grass due to the amount of PFAS in fertilisers, pesticides/ herbicides, wetting agents and the frequency of their use through out the life of the natural field.

Design Beyond the Field of Play

Whole-of-park environmental uplift should be considered as part of the business case, not as an optional add-on. Contemporary synthetic surface projects can support environmental sustainability when they are planned, designed, procured, managed and renewed as part of a full lifecycle approach.

This means assessing the surface alongside the surrounding parkland, including tree canopy, water harvesting, passive open space retention, active transport links, lighting impacts, recycled materials, green engineering, and circular economy outcomes. The strongest opportunities occur when a high-use synthetic or engineered surface is located strategically, reducing pressure on multiple natural turf fields and helping councils avoid converting additional passive parkland into active sport space.

Water, Cooling & Landscape

Water-sensitive urban design can turn a surface project into a broader parkland upgrade. Drainage can capture, slow, treat and reuse water rather than simply moving it off site. Rain gardens, swales, tanks, filters, wetlands and irrigated planting can support shade, cooling and biodiversity around the field.

Heat reduction strategies should be addressed through tree canopy, shade structures, light-coloured surrounding materials, organic or lower-heat infill choices, water reuse and sport heat policies. These measures can improve comfort while strengthening the wider open space network.

Strategic Focus

Purpose - To embrace environmental sustainability into the planning, design, procurement, management and end of life of synthetic sports surfaces.

- To create environments that encourage people to be active, exercise, play, recreate and participate in community sport in a manner that reduces the impact on local environments
- To design environments in a manner that allows us, as custodians of the land to manage and maintain an ecological balance of the local environment
- To protect and where possible enhance the environmental value of the area protecting future generations from climate change and material scarcity

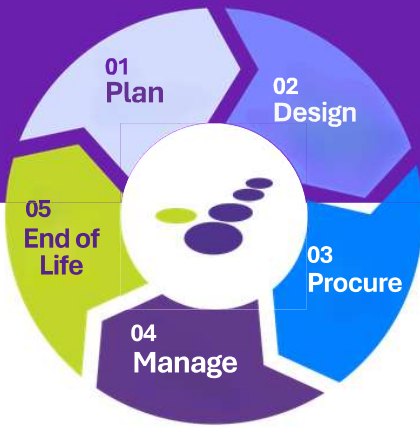
Key sustainability principles - To achieve these aims we will promote the following principles.

1. **Reduce** – reduction in energy consumption, carbon footprint, natural waste etc.
2. **Reuse** – extend the lifespan of products, repurposing components of a sports surface system etc.
3. **Recycle** – converting used materials into new products or taking components back to their raw state so they can be used again and again (circular economy).
4. **Rethink** – calling on local government and sport to question traditional practices, re-evaluating business models, programming approaches and create 'lower environmental impacts.
5. **Refuse** – choosing not to purchase or consume unnecessary and unsuitable products (e.g. one with a high environmental footprint or ones that cannot be recycled at the end of life).
6. **Repair** – fix broken or damaged sports surfaces as opposed to replacing them. This needs to be part of the maintenance strategy – Repair Early to Save Money and Extend Life.

Measure, Specify and Verify Environmental Outcomes

Environmental opportunity also relies on setting measurable standards at the planning and design stage. Councils should specify outcomes such as water capture and reuse, minimum drainage performance, microplastic containment, heat reduction, material testing, durability, recycled content, and end-of-life recovery before procurement begins. The references note that not all synthetic systems are environmentally positive, so specifications should reward proven performance rather than generic sustainability claims. This includes selecting lower-risk infills, using durable UV-stabilised systems, designing for long pavement life, including shade and cooling measures, and requiring suppliers to demonstrate how the surface, shockpad, infill and backing will be maintained, separated, reused or recycled at renewal.

Recommendations



The Sports & Play Industry Association (SAPIA) brings together the organisations that create the places where people of all ages and abilities can play, move and participate. Through professional standards, industry leadership and innovation, we are building and maintaining better places for a more active world.

To provide these SAPIA Insight Notes, we have partnered with Smart Connection Consulting to provide the latest technical knowledge on the issues that the community are keen to understand better. These notes are based around the NSW & SA Governments Frameworks for Decision Making for Synthetic Sports Fields.

Plan

- Start with open space and sports field network need.
- Compare natural, hybrid and synthetic options fairly.
- Avoid sensitive habitat, waterways, high-risk flood areas and unsuitable sites.
- Set environmental objectives before design begins.
- Assess heat, stormwater, soil, biodiversity, access and lifecycle impacts.
- Consult community, sport, open space, environment and asset teams early.
- Embrace and plan for the circular economy in the design, procurement, management and recycling of the surfaces stages.

Design

- Integrate drainage, filtration, water reuse and planting.
- Retain existing trees and expand canopy where possible.
- Use shade, green buffers and cooler surrounding materials.
- Include kerbs, upstands, brush zones and filtered drainage to reduce material migration.
- Select materials for durability, lower heat, lower pollutant risk and future recovery.
- Design access so maintenance and environmental controls are practical.

Procure

- Specify proven environmental performance, not just lowest cost.
- Require material declarations, durability testing and relevant standards.
- Ask suppliers for carbon, recyclability and end-of-life information.
- Include stormwater, filtration and maintenance requirements in tender documents.
- Separate independent design advice from construction where appropriate.
- Require training, handover, warranties, testing and environmental management plans.

Manage

- Maintain the surface, drains, filters, edges and surrounding landscape.
- Record use, cleaning, repairs, infill top-ups, water quality checks and incidents.
- Remove loose fibres, infill, litter and leaf matter before they migrate.
- Monitor heat, shade, tree health and user comfort.
- Adjust bookings or use during unsuitable weather.
- Review environmental performance annually and update the management plan.

End of Life

- Begin end-of-life planning before construction.
- Choose products with clear recovery, separation and recycling pathways.
- Track materials, repairs and replacements to support future renewal.
- Improve design, maintenance, materials and whole-of-parkland environmental outcomes.

To understand how SAPIA can assist you in making a difference to your projects and the community understanding of this technical subject please contact the SAPIA office at office@sapia.org.au or on our website www.sapia.org.au.